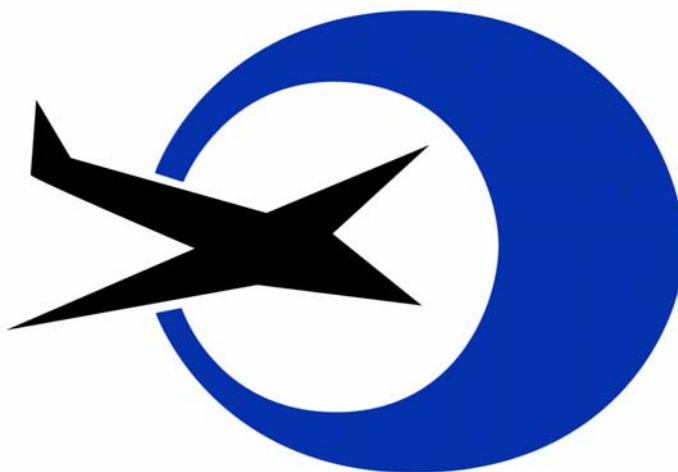# *Free Flight Status Report*

January 2001

Free Flight Program Status Report

Introduction

This status report provides an executive-level assessment of the programs managed within the Free Flight office. It focuses on significant topics reflective of current technical, schedule, cost and financial status.

The technical, schedule and financial data information presented in this report are as of January 31, 2001. Program financial data reflects the FY 2001 appropriation.

This report is designed to meet your needs. I am interested in your comments. Please direct comments to Anthony Willett, Free Flight Chief of Staff, at (202) 220-3300. His fax number is (202) 220-3312.

_____
Charles E. Keegan, Director
Free Flight

Free Flight Phase 1 Status Report

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Free Flight Phase 1 Status Report

Program Assessment Matrix

Capability Name	Team Leader	Technical Status	Schedule Status	Financial Status
FREE FLIGHT PHASE 1				
Collaborative Decision Making (CDM)	James Wetherly	G	G	G
User Request Evaluation Tool (URET)	Tom Spellerberg	G	G	G
Traffic Management Advisor (TMA)/ passive Final Approach Spacing Tool (pFAST)	Claire Robinson	G	G	G

NOTE: Assessment criteria are discussed in Appendix B-1

Free Flight Program Status Report
Program Overview

The Free Flight effort continues development of new air traffic management functionality. It sustains and enables initiation of a replacement program for existing infrastructure with a system that will allow integration and implementation of this new air traffic management functionality.

Advanced traffic flow functions are being developed to support real-time information exchange essential to furthering the progress toward FAA/industry collaborative decision making and the economics associated with implementing the concept called "Free Flight."

FFP1 is a subset of Free Flight and is designed to deploy five new core capabilities by the end of 2002. FFP2 is a continuation of FFP1 with an added R&D Program. One of Free Flight Phase 1's core capabilities, Surface Movement Advisor, was completed ahead of schedule in December 1999.

FFP1 Capabilities and Associated Flight Domains

•Average time flown from 40 nmi outside departure airport to 40 nmi outside arrival airport

•Flight time from 299 nmi range ring to meter fix

•Arrival delay (difference of planned time of arrival and actual time of arrival)

•Taxi times

•Gate delay

•Taxi times

•Gate delay
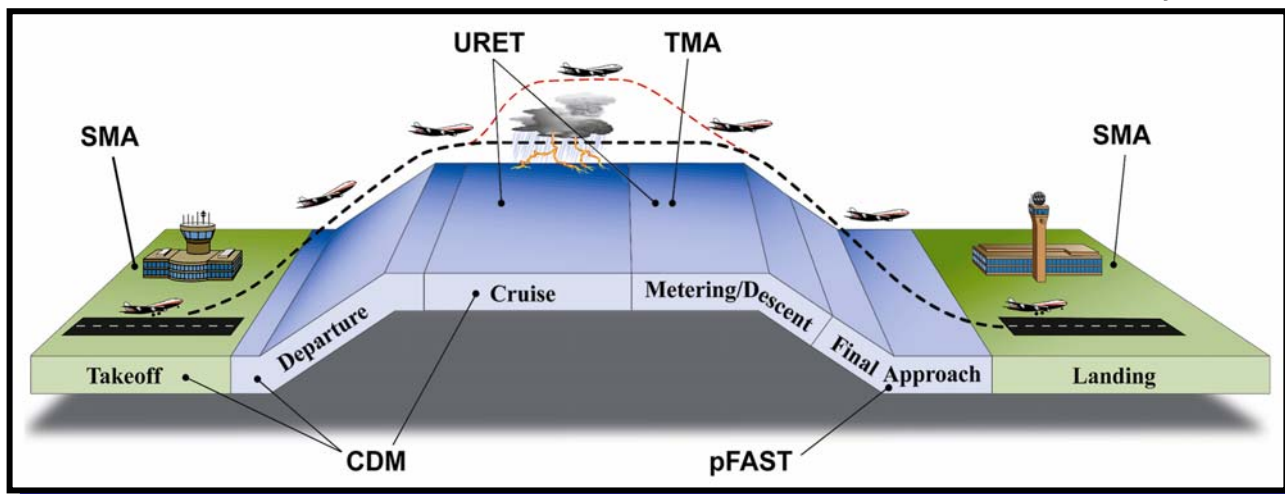
•Flight time (100 - 40 nmi from destination airport) during Ground Delay Program

•Average difference of planned time versus actual time (arrival time, departure time)

•Flight time from meter fix to runway threshold

Collaborative Decision Making

This element of the Free Flight Phase 1 allows FAA traffic flow managers to work in near real- time with the airlines in responding to NAS congestion. These decision-support services will be introduced initially into the NAS as prototypes so that the FAA and users may test new functions in an operational context and to provide feedback on their design and implementation.

Technical Status

Current Assessment **G**　　　**G** Previous Assessment

Significant Accomplishments:

- The Initial Collaborative Routing component of CDM is complete. It displays conferencing of a shared view of real-time traffic flow situations and provides a way for users to display alternate routing around hazardous weather and airspace in special use.

- The Ground Delay Program - Enhanced component of CDM is complete.

- Runway Visual Range data availability programs are nearing completion. Runway Visual Range sensors provide visibility measurements for the touchdown, mid-point, and roll-out points on instrumented runways every two seconds. This information will be provided in a data table every minute to participating users.

- Operational test and evaluation of Runway Visual Range remoting software has been completed at the FAA Technical Center (1/29). Testing is on-going at Boston, Memphis, and the National Transportation Systems Center.
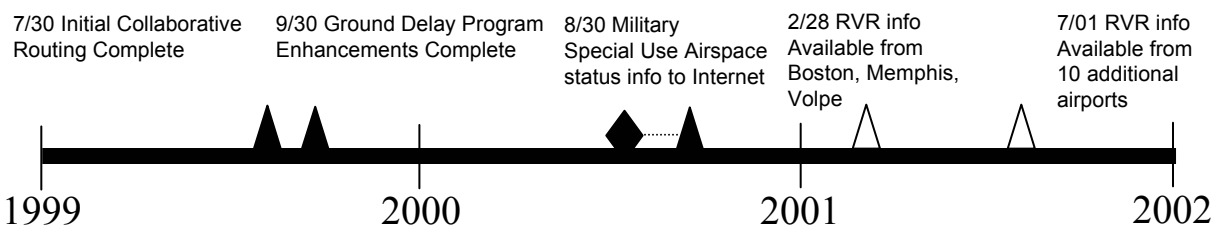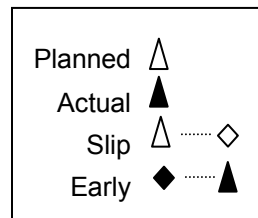
Collaborative Decision Making
Schedule Status

Current Assessment **G** **G** Previous Assessment

Planned	△
Actual	▲
Slip	△·······◇
Early	◆·······▲

Schedule:

7/30 Initial Collaborative Routing Complete	9/30 Ground Delay Program Enhancements Complete	8/30 Military Special Use Airspace status info to Internet	2/28 RVR info Available from Boston, Memphis, Volpe	7/01 RVR info Available from 10 additional airports

1999   2000   2001   2002

Near-Term Schedule:

Airport Configuration Data including active runways for approach and departure, types of departures and approaches, and remarks on safety and capacity became available	August 30, 2000	Complete
Runway Visual Range (RVR) operational test and evaluation to be conducted at the FAA Technical Center	January 30, 2001	Complete
RVR Quick Look Report, the preliminary test results from the operational test, becomes available	February 28, 2001	
RVR information becomes available to users from Boston and Memphis airports.	February 28, 2001	
Additional 10 site surveys (preliminary installation planning) due for completion. Sites to be determined.	May 30, 2001	

User Request Evaluation Tool

URET is a decision-support tool. URET provides radar assistant (D-side) controller with a strategic planning aid that predicts aircraft conflict 20 minutes into the future. The tool predicts whether an aircraft will violate minimum separation requirements with another aircraft or airspace. The tool allows the D-side controller to assist the radar controller in eliminating potential conflicts before the situation requires tactical maneuvering. The URET prototype is working at Indianapolis and Memphis air route traffic control centers. URET core capability limited deployment will be implemented at seven sites, including Indianapolis and Memphis.

Technical Status

Current Assessment **G**   **G** Previous Assessment

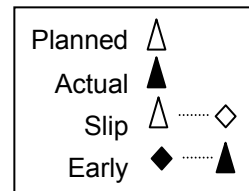## Significant Accomplishments:

- URET limited deployment hardware kits were delivered to all planned URET sites (Memphis, Kansas City, Washington, Cleveland, Atlanta, Chicago, and Indianapolis Centers) on January 3. The purpose of this kit delivery is to enable the controllers to become familiar with the hardware prior to its actual installation and operational use.

- URET Build 1 software development was completed on January 5. The program now moves on to the software integration and test phase.

- The Memphis and Indianapolis prototype sites received planned improvement software upgrades on January 8.   This upgrade corrects "bugs" that have arisen in operations such as false overdue aircraft indications, a "grey out" mistiming on trajectory lines, some duplication in departure lists, some corrections in trajectories, and a modification to holding area logic. This is part of the planned upgrade and correction of URET software, which occurs on a continuing basis.
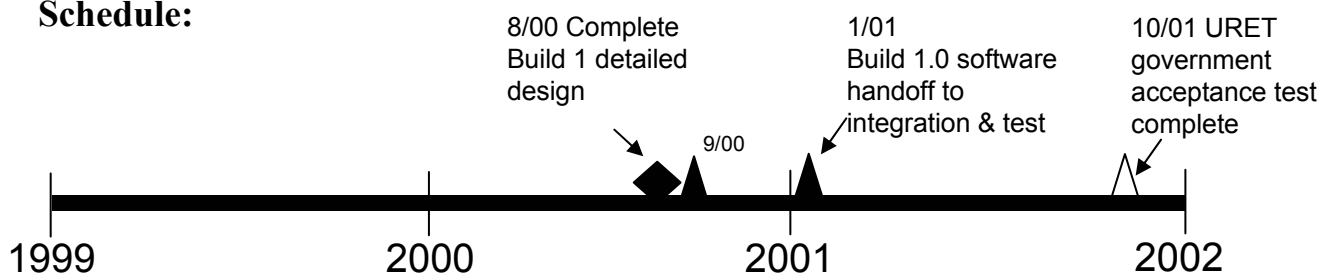
User Request Evaluation Tool
Schedule Status

Current Assessment **G**   **G** Previous Assessment

Planned	△	
Actual	▲	
Slip	△ ┄ ◇	
Early	◆ ┄ ▲	

Schedule:

8/00 Complete Build 1 detailed design

9/00

1/01 Build 1.0 software handoff to integration & test

10/01 URET government acceptance test complete

1999 — 2000 — 2001 — 2002

(Build 1.0 will provide all functionality identified by user team of air traffic controllers required for initial daily use.)

Near-Term Schedule:

URET Core Capability Limited Deployment software drop 5 completed (software design was divided into five developmental steps known as drops)	October 2, 2000	Complete
Weather and radar processor modification details provided to Lockheed Martin by the FAA to ensure compatibility of URET and the weather system input	November 1, 2000	Complete
Software development completed for Build 1. Build 2 will provide additional capability as an add-on to Build 1.	January 5, 2001	Complete
Display System Replacement synchronization software complete (enables URET operation with the display system replacement)	March 30, 2001	
WARP weather information system available at Kansas City	April 30, 2001	
Kansas City installation and checkout complete	May 31, 2001	
National Airspace System software available for key site test	June 30, 2001	

Traffic Management Advisor / passive Final Approach Spacing Tool

The Traffic Management Advisor helps en route/terminal controllers schedule aircraft. The passive Final Approach Spacing Tool provides runway assignment and sequence numbers to controllers. pFAST operates in conjunction with TMA to provide an integrated traffic management system decision support tool suite. En route and terminal traffic management coordinators will use TMA, and terminal radar controllers will use pFAST.

Technical Status

Current Assessment **G** **G** Previous Assessment

Significant Accomplishments:

- The Miami Center completed TMA site system test on January 5. Facility shadowing testing began on January 16. The shadowing test permits evaluation of advisories given by the software and the site adaptation with a live data feed at the site without being used in actual operations.

- Virtual Private Networks were installed at Miami, Denver, and Oakland Centers (1/5, 1/12, 1/26 respectively). These virtual networks provide enhanced data transmission security to TMA.

- A pFAST Airway Facilities national user team meeting was held on January 10. The national user team consists of representatives from the Free Flight Office, the Professional Airways Systems Specialists union (PASS), and representatives of each of the scheduled pFAST sites (management, union, and local users representatives). The purpose is to provide information to the Airway Facility community in continuing pFAST equipment maintenance and installation issues.

- The initial analysis of the effect of TMA at Minneapolis indicates:
  - Increased throughput rate (~ 3.0 flights per peak 30 minute arrival period)
  - Decreased flying time through extended terminal airspace (~ 45-69 second per arrival)
  - Increased arrival rate (~ 1.0 to 1.3 flights per peak 30 minute arrival period)
  - This represents about a 5% increase in airport capacity during peak periods
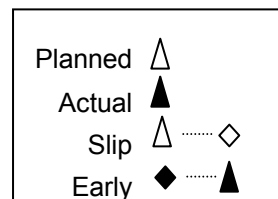
Traffic Management Advisor /
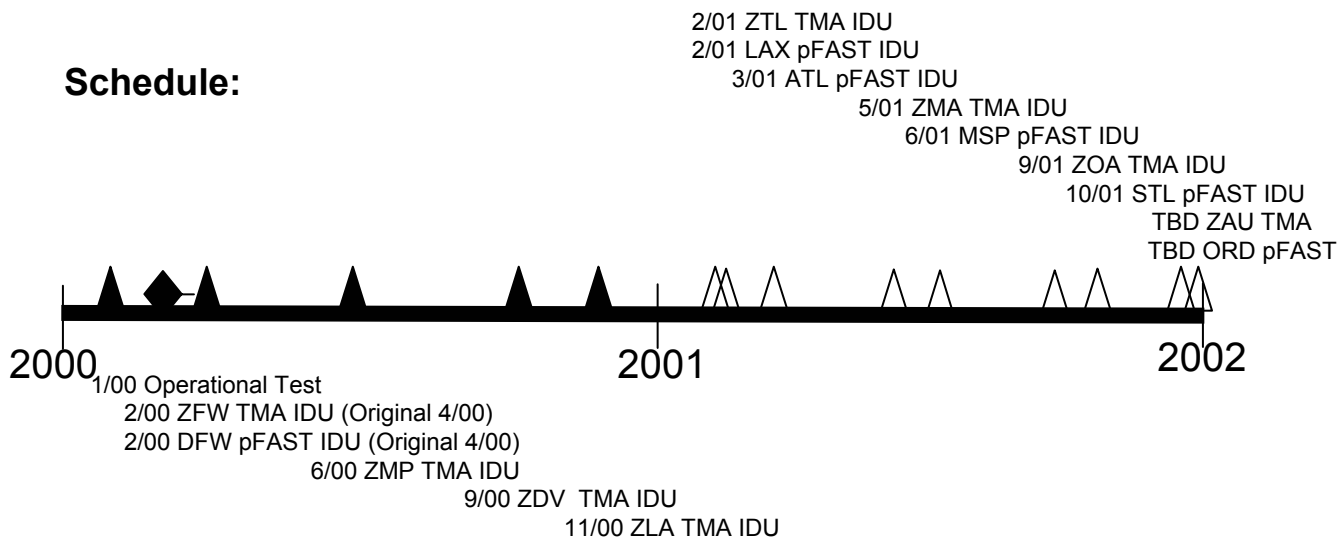# passive Final Approach Spacing Tool
Schedule Status

Current Assessment **G**   **G** Previous Assessment

Planned	△
Actual	▲
Slip	△ ┄ ◇
Early	◆ ┄ ▲

Schedule:

2/01 ZTL TMA IDU
2/01 LAX pFAST IDU
3/01 ATL pFAST IDU
5/01 ZMA TMA IDU
6/01 MSP pFAST IDU
9/01 ZOA TMA IDU
10/01 STL pFAST IDU
TBD ZAU TMA
TBD ORD pFAST

2000   2001   2002

1/00 Operational Test
2/00 ZFW TMA IDU (Original 4/00)
2/00 DFW pFAST IDU (Original 4/00)
6/00 ZMP TMA IDU
9/00 ZDV TMA IDU
11/00 ZLA TMA IDU

Near-Term Schedule:

pFAST installed at Atlanta Traffic Management Unit	October 6, 2000	Complete
TMA achieved initial daily use at Los Angeles Center	November 21, 2000	Complete
TMA achieves "planned capability achieved" status at Minneapolis Center	December 20, 2000	Complete
TMA begins facility shadow testing at Miami Center (the last test before beginning IDU)	January 16, 2001	In Process
pFAST begins IDU at Southern California TRACON	February 9, 2001	
pFAST begins IDU at Atlanta TRACON (A80)	March 19, 2001	
TMA training for extended controller cadre at Miami Center	March 30, 2001	
TMA achieves IDU at Miami Center	May 23, 2001	

Free Flight Phase 1
## Program Financial Status
As of 01/31/01

Current Assessment (G)   (G) Previous Assessment

F&E Funding
Program: (FY 98-FY 02)	$628.8
Prior Year Net Appropriations:	$337.5
Fiscal Year ('01) Appropriations:	$169.5
Prior Year Obligations:	$335.0
Fiscal Year ('01) Obligations:	$ 83.1
Unobligated Appropriations:	$ 88.9

Funding Profile: ($M) (F&E)

$0.0 $418.1 $507.0 $628.8

Total Program

Cumulative Appropriations

Cumulative Obligations
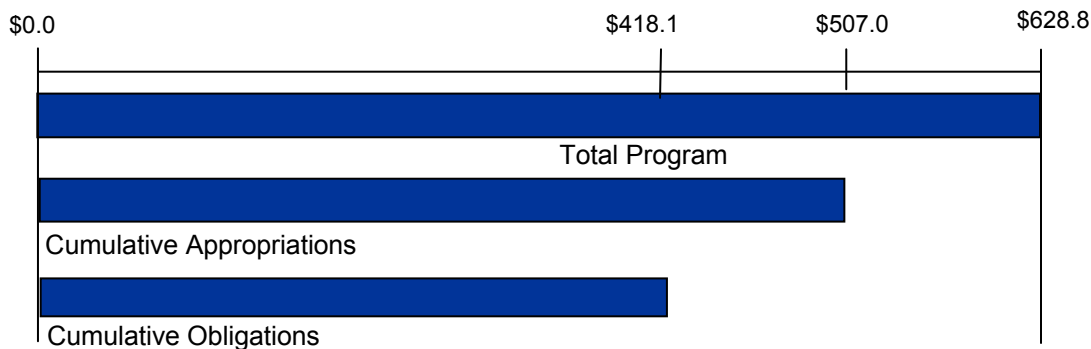
Contract Cost Status:

- Satisfactory

Program Funding:

- The $628.8M Free Flight Phase 1 five year (FY 98 – 00) total is the program baseline presented to the JRC on 4/7/99.

- 0.22% was rescinded from the FY 01 appropriation.

APPENDICES

Status Report Definitions

Technical Status:

*Significant Accomplishments***:** Significant technical tasks completed since the last report.

*Concerns and Ongoing Actions***:** Outstanding technical concerns, which must be resolved to assure successful accomplishment of technical project objectives and the actions being taken to resolve them, and discussion of other technical activities.

Schedule Status:

Major Milestone Accomplishment: Listing of the Level I and Level II milestones completed during the past reporting period. (Sixty managed milestones have been established. Level I = 10 most significant. Level II = remaining 50 managed milestones.)

*Concerns and Ongoing Actions***:** Discussion of current and potential schedule impacts resulting from schedule slippage and the actions taken to develop work-arounds or recovery plans, and other schedule related activities.

Financial Status:

*Contract Cost Status***:** Assessment of cost performance status as to the executability of the program within approved resources.

*Program Funding***:** Assessment of the overall adequacy and availability of programmed and budgeted funds.

*Concerns and Ongoing Actions***:** Discussion of current or potential impacts to the cost baseline or estimates to complete, arising from contractor performance and the actions being taken to mitigate them; impacts of funding shortfalls, reductions, or non-availability due to Congressional or DOT decisions and the actions being taken to resolve or mitigate them; and other financial related activities.

Assessment Criteria

Technical Status:

Red: Technical problems will cause the system-level performance to fall below the defined *threshold* value established for any *critical* parameter in the operational requirements documents (ORD).

Yellow: Technical problems will cause the system-level performance to fall below the defined threshold *objective* value for any *critical* parameter in the ORD.

Green: No technical problems exist causing system-level performance to fall below defined *objective* performance values established for all *critical* parameters in the ORD.

Schedule Status:

Red:	Level I Milestone	(next 6 months)	>	15 working days late
		(6-12 months)	>	30 working days late
		(beyond 12 mo.)	>	60 working days late
Yellow:	Level I Milestone	(next 6 months)	>	6 working days late
	Level II Milestone	(next 6 months)	>	15 working days late
		(6-12 months)	>	30 working days late
		(beyond 12 mo.)	>	60 working days late

Green: Level I and II Milestones are on schedule within the criteria listed above.

Financial Status:

Red: Total approved program is insufficient to cover the full scope of the project development and implementation, or Government's projection of contractor's estimate-at-completion *will* exceed contractor's total allocated budget.

Yellow: Current year project needs do not match available project dollars and may require current year reprogramming, or Government's projection of Contractor's estimate-at-completion *may* exceed contractor's total allocated budget.

Green: Funding authorizations meet the program requirements, and contractor's total allocated budget is adequate to meet project requirements.

Acronyms and Abbreviations

ARTCC	Air Route Traffic Control Center
ATL	Hartsfield Atlanta International Airport
CDM	Collaborative Decision Making
CTAS	Center TRACON Automation System
DFW	Dallas Fort Worth
DOT	Department of Transportation
FAA	Federal Aviation Administration
F&E	Facilities and Engineering
FFP1	Free Flight Phase One
FFP2	Free Flight Phase Two
FY	Fiscal Year
IDU	Initial Daily Use
JRC	Joint Resource Council
LAX	Los Angeles
MSP	Minneapolis-St. Paul
NAS	National Airspace System
NMI	Nautical Miles
ORD	Chicago O'Hare International Airport
PCA	Planned Capability Achieved
pFAST	Passive Final Approach Spacing Tool

R&D	Research and Development
RVR	Runway Visual Range
SMA	Surface Movement Advisor
STL	Lambert/St. Louis International Airport
TBD	To Be Determined
TMA	Traffic Management Advisor
TRACON	Terminal Radar Approach Control
URET	User Request Evaluation Tool
WARP	Weather and Radar Processor
ZAU	Chicago ARTCC
ZDV	Denver ARTCC
ZFW	Fort Worth ARTCC
ZLA	Los Angeles ARTCC
ZMA	Miami ARTCC
ZMP	Minneapolis ARTCC
ZOA	Oakland ARTCC
ZTL	Atlanta ARTCC